DEER CREEK LAKE

2004 Fish Management Report

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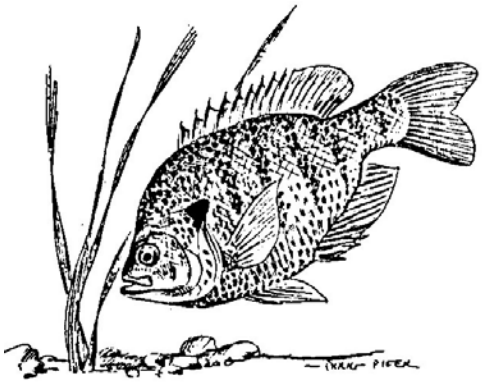

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INDIANA DEPARTMENT OF NATURAL RESOURCES
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2005

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Perry County

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INTRODUCTION

Deer Creek Lake is a 39-acre impoundment located in the Hoosier National Forest about 9 miles northeast of Tell City. The lake was constructed in 1980 as a flood control impoundment. Several measures were taken during lake construction to enhance the fishery. Two peninsulas and an island were formed, standing timber was left in several areas, and a bottom drawdown pipe was installed. The surrounding watershed is owned by the U.S. Forest Service and is mostly forested. Anglers must walk about ¼ mile to reach the lake from a parking lot on County Road 81. While some anglers might carry in a small boat or canoe, most angling is done from the bank.

Past fish management activities have included a pre-impoundment fish eradication in 1980, fish management surveys in 1982, 1987, 1990, 1993, 1999, and a spot check survey in 1983. A largemouth bass 14-inch minimum size limit went into effect in September 1984. Previous fish stockings consisted of a tiger muskellunge stocking in 1981, biennial channel catfish stockings from 1980 to 1986, and 300 triploid grass carp in 2001.

The 1993 fisheries survey documented a slow growing largemouth bass population where most of the bass were probably dying of old age before they reached 15.5 inches. It was anticipated that the large number of small bluegill surveyed would help improve bass growth in the future.

In 1999, aquatic vegetation was found to be overabundant, impeding fishing access and negatively affecting the fishery. Bluegill growth had decreased since 1993. It was recommended that aquatic vegetation control be implemented to improve sport fish production and fishing access for shore anglers.

The current fisheries survey was conducted on June 21-22, 2004 to evaluate the fishery and aquatic vegetation after the grass carp stocking. Fish collection effort consisted of 0.75 hour of pulsed D.C. night electrofishing, two gill net lifts, and one trap net lift. Two dippers collected fish stunned by the electrofishing boat. Dissolved oxygen and temperature profiles, pH, turbidity, conductivity, and total alkalinity data were collected according to standard survey guidelines. An aquatic vegetation survey was conducted on August 12.

RESULTS

Water chemistry was normal for the area and dissolved oxygen was sufficient for fish survival to a depth of 4 feet. The conductivity was 111 microsiemens. Turbidity was moderate as indicated by a secchi disk reading of 4 feet during the fish survey and 3 feet during the vegetation survey. The lake's water level was 5 feet higher than what was recorded in 1999.

The aquatic vegetation survey consisted of 29 littoral sites, of which two contained some amount of vegetation. Abundance was very low as indicated by a mean rake score of 0.55 (max = 5.00). Chara and filamentous algae were the only species present.

A total of 602 fish, representing eight species, was collected that weighed 89.18 pounds. Bluegill were most abundant by number followed by largemouth bass, redear sunfish, yellow bullhead, black crappie, longear sunfish, green sunfish, and pirate perch.

A total of 416 bluegill was collected that weighed 14.35 pounds. They ranged in length from 0.6 to 8.4 inches. Relative abundance was 69% by number and 16% by weight. The bluegill electrofishing catch rate was 549.3 per hour, a 144% increase from 1999 (225.3 per hour). This catch rate increase is most likely due to collection difficulties from overabundant aquatic vegetation in 1999. The gill net and trap net catch rates were 1.5 and 1.0 per lift. In 1999, no bluegill were collected in gill nets and the trap net catch rate was 2.0 per lift. Bluegill growth has not changed for ages 1 through 3 since 1999. When compared to the district average, ages 2 through 4 were at the low end of the average range.

The bluegill proportional stock density (PSD) was 6. The suggested bluegill PSD range indicating a balanced fishery is 20 to 60 (Anderson and Neumann 1996). The relative stock density of bluegill seven inches or longer (RSD7) was 4 and the RSD8 was 2. The bluegill fishing potential (BGFP) index classified the lake as having “good” bluegill fishing with an index rating of 19 (Ball and Tousignant 1996). The 1999 survey data could not be used to generate reliable population indices due to the collection of only 12 stock size bluegill.

A total of 124 largemouth bass was collected that weighed 50.52 pounds. They ranged in length from 4.2 to 15.8 inches. Bass relative abundance was 21% by number and 57% by weight. The bass electrofishing catch rate increased from 104.0 (1999) to 162.7 per hour. The gill net catch rate was 1.0 per lift and no bass were collected in trap nets. Growth was similar to 1999 results and was average for all ages when compared to the district averages.

The bass PSD index value decreased from 54 in 1999 to 33. The suggested largemouth bass PSD range indicating a balanced fishery is 40 to 70 (Anderson and Neumann 1996). The largemouth bass RSD14 increased from 0 (1999) to 17.

Thirty-nine redear sunfish were collected that weighed 15.18 pounds. They ranged in length from 3.3 to 10.4 inches. Relative abundance was 7% by number and 17% by weight. The redear sunfish electrofishing catch rate increased from 8.0 (1999) to 44.0 per hour. No redear were collected in gill nets and the trap net catch rate was 6.0 per lift. In 1999, the gill net and trap net catch rates were 1.0 and 7.0 per lift. Growth for all ages has decreased since 1999. Age 2 redear are below the district average and other ages are currently at the district average.

Other species collected include yellow bullhead, black crappie, longear sunfish, green sunfish, and pirate perch. Collectively they accounted for 4% of the total catch by number and 10% by weight

CONCLUSIONS AND RECOMMENDATIONS

The best fishing at Deer Creek Lake is for largemouth bass and panfish. There were more legal size largemouth bass collected than in any other previous survey. Bluegill were collected up to 8.4 inches and redear up to 10.4 inches.

Excessive aquatic vegetation is no longer a problem at Deer Creek Lake and the fish community has improved since 1999. The 2002 bluegill year class reached an average of 2.2 inches in their first year of growth. A corresponding increase in growth was found in the 2001 largemouth bass year class where they grew an estimated 4.1 inches in 2002.

Higher than average rainfall and the associated increase in water level and turbidity, combined with the stocking of grass carp, has effectively eliminated aquatic vegetation at Deer Creek Lake. The lack of vegetation can be just as bad as having too much vegetation. When there is no vegetation, bluegill do not have enough habitat to evade predation resulting in a substantial decrease in their population. Largemouth bass growth can decrease due to the limited forage and the bass population can tend to stock pile around 12 to 13 inches. This has not yet occurred, however it is likely to occur if aquatic vegetation remains low. For this reason, no additional vegetation control should be attempted at Deer Creek Lake. The plant community needs to increase to approximately 25% to 30% bottom coverage.

Catfish fishing pressure is assumed to be high at Deer Creek Lake. Catfish anglers and several jug and trot lines were observed during the survey. Also, the channel catfish gill net catch rates have decreased from a high of 7.0 per lift in 1993 to 0 in 2004. A one-time channel catfish stocking is recommended. The Division of Fish and Wildlife should stock 1,950 (50/acre), 8 to 10 inch channel catfish in 2006.

LITERATURE CITED

Anderson, R. O. and R. M. Neumann. 1996. Length, weight, and associated structural indices. Pages 447-481 *in* B. R. Murphy and D. W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Ball, R.L. and J.N. Tousignant. 1996. The development of an objective rating system to assess bluegill fishing in lakes and ponds. Research report. Indiana Department of Natural Resources. Indianapolis, Indiana. 18 pp.

Submitted by: Jason C. Doll, Assistant Fisheries Biologist
Date: March 8, 2005

Approved by: Daniel P. Carnahan, Fisheries Biologist

Approved by: _____
Brian M. Schoenung, Fisheries Supervisor
Date: June 8, 2005

LAKE SURVEY REPORT

Type of Survey: [ ] Initial Survey [x] Re-Survey

Lake Name	County	Date of survey (Month, day, year)
Deer Creek Lake	Perry	June 21-22, 2004
Biologist's name		**Date of approval (Month, day, year)**
Jason C. Doll		June 8, 2005

LOCATION

Quadrangle Name	Range	Section
Gatchel, Cannelton, Perry	2W	9, 10, 16
Township Name	**Nearest Town**	
6S	Gatchel	

ACCESSIBILITY

State owned public access site	Privately owned public access site	Other access site
		U.S.F.S. Walk-in lake

Surface acres	Maximum depth	Average depth	Acre feet	Water level	Extreme fluctuations
39	18	5.9	230	437.2	5 feet

Location of benchmark: NW¼, SW¼, S11, T6S, R2W

INLETS

Name	Location	Origin
Middle Deer Creek	Uppermost end	runoff
Unnamed tributary	East side	runoff

OUTLETS

Name	Location
Middle Deer Creek	Middle of Dam

Water level control: 4'6" x 9'2" outlet structure with a 30 inch gate valve on bottom.

POOL	ELEVATION (Feet MSL)	ACRES
TOP OF DAM	464.4	
TOP OF FLOOD CONTROL POOL	457.0	117
TOP OF CONSERVATION POOL	437.2	39
TOP OF MINIMUM POOL	422.0	
STREAMBED		

Bottom type

	Bolder
x	Gravel
x	Sand
x	Muck
x	Clay
	Marl

Watershed use: Forested

Development of shoreline: None

Previous surveys and investigations: Fisheries surveys in 1982, 1987, 1990, 1993, and 1999. Spot check survey in 1983.

** The impoundment is designed as a flood control reservoir. Therefore, water levels change with each rain event.

SAMPLING EFFORT

ELECTROFISHING	Day hours		Night hours 0.75		Total hours 0.75
TRAP NETS	Number of traps 1		Number of Lifts 1		Total effort 1 lift
GILL NETS	Number of nets 2		Number of Lifts 1		Total effort 2 lifts
ROTENONE	Gallons	ppm	Acre Feet Treated	SHORELINE SEINING	Number of 100 Foot Seine Hauls

PHYSICAL AND CHEMICAL CHARACTERISTICS

Color: Brown	Turbidity: 4 Feet 0 Inches (SECCHI DISK)
Alkalinity (ppm)*: Surface: 51.3 Bottom: 51.3	pH: Surface: 7.5 Bottom: 6.8
Conductivity: 111 microsiemens	Air temperature: 90.3 °F
Water chemistry GPS coordinates: N 38.0005	W -86.6240

TEMPERATURE AND DISSOLVED OXYGEN (D.O.)

DEPTH (FEET)	Degrees (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)	DEPTH (FEET)	DEGREES (°F)	D.O. (ppm)
SURFACE	81.7	6.1	36			72		
2	79.7	5.9	38			74		
4	74.5	3.3	40			76		
6	68.2	1.0	42			78		
8	65.3	0.6	44			80		
10	61.3	0.4	46			82		
12	58.5	0.4	48			84		
14	56.1	0.5	50			86		
16	56.1	0.3	52			88		
18	56.1	0.1	54			90		
20			56			92		
22			58			94		
24			60			96		
26			62			98		
28			64			100		
30			66					
32			68					
34			70					

COMMENTS

Lake was 5 feet higher than during the 1999 survey

*ppm-parts per million

Occurrence and Abundance of Submersed Aquatic Plants

Date:	8/12/04	Littoral sites with plants:	2	Species diversity:	0.00
Littoral depth (ft):	7.5	Number of species:	1	Native diversity:	0.00
Littoral sites:	29	Maximum species/site:	1	Rake diversity:	0.00
Total sites:	31	Mean number species/site:	0.07	Native rake diversity:	0.00
Secchi:	3.0	Mean native species/site:	0.07	*Mean rake score:	0.55

Common Name	Site frequency	Relative density	Mean density	Dominance
Chara	6.9	0.07	1.00	1.4
Filamentous algae	55.2			
Other Observed Plants:				
Spatterdock				

*Mean rake score includes filamentous algae

SPECIES AND RELATIVE ABUNDANCE OF FISHES COLLECTED BY NUMBER AND WEIGHT					
*COMMON NAME OF FISH	NUMBER	PERCENT	LENGTH RANGE (inches)	WEIGHT (pounds)	PERCENT
Bluegill	416	69.1	0.6 - 8.4	14.35	16.1
Largemouth bass	124	20.6	4.2 - 15.8	50.52	56.6
Redear sunfish	39	6.5	3.3 - 10.4	15.18	17.0
Yellow bullhead	10	1.7	7.4 - 13.6	7.15	8.0
Black crappie	6	1.0	2.0 - 12.3	1.40	1.6
Longear sunfish	5	0.8	2.6 - 3.4	0.15	0.2
Green sunfish	1	0.2	8.0	0.42	0.5
Pirate perch	1	0.2	1.4	0.01	< 0.1
Total	602			89.18	

*Common names of fishes recognized by the American Fisheries Society.

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF BLUEGILL									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5	16	3.8	0.01	1	19.5				
2.0	67	16.1	0.01	1	20.0				
2.5	89	21.4	0.01	1	20.5				
3.0	117	28.1	0.02	1,2	21.0				
3.5	66	15.9	0.03	1,2	21.5				
4.0	7	1.7	0.04	2,3	22.0				
4.5	13	3.1	0.06	3	22.5				
5.0	14	3.4	0.08	3,4	23.0				
5.5	10	2.4	0.11	4,5	23.5				
6.0	3	0.7	0.15	5	24.0				
6.5	3	0.7	0.20	5	24.5				
7.0	1	0.2	0.26	6	25.0				
7.5	4	1.0	0.32	6	25.5				
8.0	4	1.0	0.38	6,7	26.0				
8.5	2	0.5	0.46	7	TOTAL	416			
9.0									
9.5									
10.0									
10.5									
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	549.3 /hr	GILL NET CATCH	1.5 /lift	TRAP NET CATCH	1.0 /lift

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF LARGEMOUTH BASS									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5					21.5				
4.0	1	0.8	0.03	1	22.0				
4.5	10	8.1	0.04	1	22.5				
5.0	21	16.9	0.05	1	23.0				
5.5	11	8.9	0.07	1	23.5				
6.0	5	4.0	0.09	1	24.0				
6.5	6	4.8	0.12	1,2	24.5				
7.0	1	0.8	0.15	2	25.0				
7.5	1	0.8	0.18	2	25.5				
8.0	2	1.6	0.23	2	26.0				
8.5	11	8.9	0.26	2	TOTAL	124			
9.0	4	3.2	0.31	2					
9.5	8	6.5	0.36	2					
10.0	3	2.4	0.43	3					
10.5	2	1.6	0.50	3					
11.0	4	3.2	0.58	3					
11.5	8	6.5	0.68	3					
12.0	5	4.0	0.75	3,4					
12.5	3	2.4	0.87	4					
13.0	3	2.4	0.97	4					
13.5	4	3.2	1.09	4,5					
14.0	4	3.2	1.25	5					
14.5	4	3.2	1.39	5,6					
15.0	2	1.6	1.58	6					
15.5									
16.0	1	0.8	1.93	7					
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	162.7 /hr	GILL NET CATCH	1.0 /lift	TRAP NET CATCH	0.0 /lift

NUMBER, PERCENTAGE, WEIGHT, AND AGE OF REDEAR SUNFISH									
TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH	TOTAL LENGTH (inches)	NUMBER COLLECTED	PERCENT OF FISH COLLECTED	AVERAGE WEIGHT (pounds)	AGE OF FISH
1.0					19.0				
1.5					19.5				
2.0					20.0				
2.5					20.5				
3.0					21.0				
3.5	7	17.9	0.03	1	21.5				
4.0	2	5.1	0.04	1	22.0				
4.5	2	5.1	0.06	1	22.5				
5.0					23.0				
5.5					23.5				
6.0	2	5.1	0.15	3	24.0				
6.5					24.5				
7.0					25.0				
7.5	1	2.6	0.31	4	25.5				
8.0	2	5.1	0.37	4	26.0				
8.5	3	7.7	0.44	4,5	TOTAL	39			
9.0	10	25.6	0.54	5,6					
9.5	6	15.4	0.62	5,6					
10.0	3	7.7	0.72	6					
10.5	1	2.6	0.82	7					
11.0									
11.5									
12.0									
12.5									
13.0									
13.5									
14.0									
14.5									
15.0									
15.5									
16.0									
16.5									
17.0									
17.5									
18.0									
18.5									

ELECTROFISHING CATCH	44.0 /hr	GILL NET CATCH	0.0 /lift	TRAP NET CATCH	6.0 /lift

Species Bluegill	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept= 0.8	2003	17	1.4 - 3.4	1.6							
	2002	8	2.9 - 4.1	2.2	3.1						
	2001	10	4.0 - 5.0	1.5	2.8	3.8					
	2000	4	5.1 - 5.6	1.4	2.3	3.8	4.9				
	1999	7	5.7 - 6.4	1.4	2.5	3.9	4.9	5.7			
	1998	6	7.2 - 7.8	1.6	2.9	4.4	5.8	6.8	7.3		
	1997	4	8.0 - 8.3	1.4	2.4	3.5	5.4	6.9	7.5	7.9	
	AVERAGE LENGTH			1.6	2.7	3.9	5.3	6.4	7.4	7.9	
	NUMBER AGED			56	39	31	21	17	10	4	

Species Largemouth bass	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept= 0.8	2003	22	4.2 - 6.5	3.3							
	2002	20	6.7 - 9.5	3.6	7.6						
	2001	14	9.8 - 11.8	3.5	7.7	10.3					
	2000	10	11.9 - 13.4	3.6	6.7	9.9	11.9				
	1999	7	13.4 - 14.7	3.3	7.4	10.6	12.6	13.7			
	1998	3	14.6 - 15.0	4.0	7.9	10.2	12.5	13.5	14.3		
	1997*	1	15.8	5.2	7.2	9.2	10.6	12.1	13.6	14.9	
	AVERAGE LENGTH			3.6	7.4	10.2	12.3	13.6	14.3		
	NUMBER AGED			76	54	34	20	10	3		

Species Redear sunfish	YEAR CLASS	NUMBER OF FISH AGED	SIZE RANGE	BACK CALCULATED LENGTH (inches) AT EACH AGE							
				I	II	III	IV	V	VI	VII	VIII
Intercept= 0.6	2003	8	3.3 - 4.4	2.4							
	2002*	0									
	2001*	2	6.1 - 6.2	1.5	2.6	5.0					
	2000	6	7.6 - 8.7	1.5	3.2	6.6	7.7				
	1999	6	8.4 - 9.3	1.6	3.0	4.9	7.7	8.5			
	1998	5	9.2 - 9.8	1.5	3.1	6.0	7.9	8.7	9.2		
	1997*	2	10.4	1.7	4.2	6.0	8.5	9.2	9.8	10.2	
	AVERAGE LENGTH			1.7	3.1	5.8	7.8	8.6	9.2		
	NUMBER AGED			25	17	17	11	6	5		

*Not included in average length calculations.

GPS LOCATION OF SAMPLING EQUIPMENT

GILL NETS		
1	N 38.0052	W -86.6260
2	N 38.0035	W -86.6258
3	N	W
4	N	W
5	N	W
6	N	W
7	N	W
8	N	W
9	N	W
10	N	W
11	N	W
12	N	W
13	N	W
14	N	W
15	N	W
16	N	W
17	N	W
18	N	W
19	N	W
20	N	W

TRAP NETS		
1	N 38.0052	W -86.6257
2	N	W
3	N	W
4	N	W
5	N	W
6	N	W
7	N	W
8	N	W
9	N	W
10	N	W
11	N	W
12	N	W
13	N	W
14	N	W
15	N	W
16	N	W
17	N	W
18	N	W
19	N	W
20	N	W

ELECTROFISHING		
1	N 38.0005	W -86.6250
	N 38.0017	W -86.6225
2	N 38.0040	W -86.6247
	N 38.0065	W -86.6268
3	N 38.0050	W -86.6273
	N 38.0013	W -86.6250
4	N	W
	N	W
5	N	W
	N	W
6	N	W
	N	W
7	N	W
	N	W
8	N	W
	N	W
9	N	W
	N	W
10	N	W
	N	W
11	N	W
	N	W
12	N	W
	N	W
13	N	W
	N	W
14	N	W
	N	W
15	N	W
	N	W
16	N	W
	N	W
17	N	W
	N	W
18	N	W
	N	W
19	N	W
	N	W
20	N	W
	N	W